OBJECTIVE: This study aims to describe the distributions of lipid lowering and attainment of National Cholesterol Education Panel goals and apply these distributions to pharmacoeconomic models for specific populations.
METHODS: Lipid results and costs from a series of treat-to-target studies of statins (atorvastatin, fluvastatin, lovastatin, pravastatin, and simvastatin) were used to estimate distributions of lipid-lowering effects and cost for patients.
RESULTS: Almost 1000 patients were enrolled in one of three trials: patients with risk factors for coronary heart disease (CHD) in the United States, CHD in the United States, and CHD or peripheral vascular disease (PVD) in Europe. Lipid-lowering effects are not normally distributed and are not consistent among statins. Results for two statins were skewed right and results for three statins were skewed left. As a result, costs associated with lipid-lowering treatment are not normally distributed and are not equal among statins.
CONCLUSIONS: Models based upon clinical and trials and associated pharmacoeconomic analyses may be biased if they use only published data without an understanding of the underlying distributions of these data. In a set of populations with higher than average lipid levels (lower than average lipid levels), models that rely on means from published studies would underestimate (overestimate) the differences among statins.

DRUG POLICY RESEARCH

DP1

EFFECT OF DEMOGRAPHICS ON THE COST OF PHARMACEUTICALS IN A PRIVATE THIRD-PARTY PRESCRIPTION PROGRAM

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OBJECTIVES: The primary objective of this study was to compare variance in cost of pharmaceuticals explained by demographic variables with variance explained by plan-characteristics within various therapeutic categories using prescription claims data. The secondary objective was to examine differences in utilization among demographic variables after controlling for covariates.
METHODS: Data were obtained from 1996 prescription claims information for the commercial population administered by a Rhode Island–based PBM. There were 29,211 subscribers representing 64,815 enrollees (mean age 31.5) eligible during 1996. Subscribers were mainly employed in health (39.8%), sales and services (17.7%), and manufacturing (10.3%). Six therapeutic categories were analyzed. Statistical analyses utilizing multiple regression and analysis-of-covariance were performed.
RESULTS: Plan-characteristics out-performed demographic variables 16-fold for all drug categories combined in explaining variance in cost of pharmaceuticals. Significant differences ($p < 0.0001$) in utilization were found among demographic variables after controlling for average wholesale price and days supply.
CONCLUSIONS: The results obtained in this study have practical significance in the determination of capitation rates when utilization history of prospective members is unavailable. In this situation, PBMs may have to set capitation rates based solely on eligibility data. PBMs contract with commercial clients to provide pharmacy benefits to their employees irrespective of their occupation. Significant differences in utilization among the members based on place of employment suggest that benefit managers should consider differentiating capitation rates according to their clients' businesses. Finally, this study indicated that commercial members residing in Tennessee had the lowest level of drug utilization among all states evaluated. The fact that one PBM manages over 80% of the TennCare prescription program along with a significant commercial client base suggests that "spillover-effect" may exist.

DP2

THE RELATIONSHIP BETWEEN PAYER TYPE AND HOSPITALIZATION RATES FOR ASTHMATICS SUBSEQUENT TO AN EMERGENCY ROOM VISIT

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OBJECTIVE: Hospitalization is the single greatest cost in the treatment of asthma. Various factors, such as type of healthcare insurance, may be related to asthma hospitalization rates. This study assessed the hospitalization rates for asthmatics subsequent to an emergency room (ER) visit among payer types.
METHODS: Medical claims from the Premier PCD database were screened to identify adults (ages 18–65) visiting an ER for treatment of asthma (ICD-9-CM: 493) from October 1, 1996 to September 30, 1997. Subjects were then classified into two groups: ER only and ER and hospitalization. Payers identified from each claim were grouped into these categories: Managed Care, Indemnity Plans, Medicaid, Medicare, and Self-Pay.
RESULTS: Of the 2738 patients who met the inclusion criteria, only 773 (28%) required hospitalization. Self-Pay patients were the least likely to be hospitalized (12.6% hospitalization rate) while Indemnity and Managed Care patients were hospitalized at a rate of 23.4% and 33.3%, respectively. After controlling for age, race, gender, and comorbidities, Indemnity patients were approximately 65% as likely to be hospitalized as Managed Care patients (OR = 0.650; 95% CI 0.493–0.856). Of the hospitalized patients, the Self-Pay patients had the shortest hospital stay and lowest total cost (2.98 days, $2417.72). Managed Care patients had lower total costs and shorter hospital stays than Indemnity patients, however the differences among the groups were not significant. No significant differences in mean age or APR-DRG

severity were observed between hospitalized Managed Care patients or Indemnity patients.
CONCLUSIONS: Higher hospitalization rates was observed in the Indemnity patients and may be the factor for the higher overall asthma costs seen in this payer group.

DP3

USING SIMULATION MODELING TECHNIQUES TO FACILITATE THE MANAGEMENT OF THE WAITING LIST FOR LIVER TRANSPLANTATION

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OBJECTIVE: The purpose of the study was to evaluate the clinical and economic impact of alternative decision criteria in the management of the waiting list for liver transplantation. The impact of changes in the timing of transplantation for the average estimated net life expectancy of the cohort studied and the overall cost-effectiveness of the transplantation program at one London center were investigated.
METHODS: A discrete event simulation model was developed to reflect the pattern and timing of care for patients accepted to the liver transplantation program. A subsidiary simulation model was also developed to reflect the pattern and timing of care received for patients rejected for liver transplantation. The models were constructed to predict changes in the net length of survival (i.e., predicted survival with transplantation versus survival without transplantation) and resources used for individual patients according to the time at which transplantation actually occurred, and according to alternative times at which transplantation may have occurred had the waiting list been managed differently.
RESULTS: Using a 5-year time horizon the total cost per life-year gained of the liver transplantation program was £66,146 (CI £54,236–£75,688) using the current selection policy. It was found that the total cost per life-year gained could be reduced by as much as 20% (£52,917, CI £43,731–£59,298) if the less severely ill patients no longer received priority for a donor organ.
CONCLUSIONS: The pursuit of efficiency in the provision of liver transplantation also needs to be reconciled with the important issues of equity and fairness in donor organ allocation. However, the results of this study suggest that the overall cost-effectiveness of the liver transplantation program could be improved if the current selection policy were modified to take account of the reduced chances of success of the more severely ill patients.

DP4

USING COST OF ILLNESS STUDIES IN HEALTHCARE POLICY-MAKING

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Cost of illness studies have two main uses: to measure baseline outcomes and changes over time as a function of changing inputs, and to generate new research hypotheses.
OBJECTIVES: To evaluate the usefulness of cost of illness studies by testing the likely validity of results.
METHODS: We reviewed all English-language, peer-reviewed, US studies of specified diagnoses published 1 January 1985 to 31 December 1998. Studies were obtained from MEDLINE and other computerized searching systems. Direct and indirect costs were adjusted to 1992 dollars for sector-specific (e.g., hospital) inflation since year of the study. Additional adjustments were made by diagnosis for technological innovations. Cost comparisons were made among multiple studies for the same illness.
RESULTS: Of the 1556 studies identified, only 179 met all inclusion criteria. By diagnosis, cost of illness varied 2- to 10-fold even after adjustments for inflation and effects of new technology. Such large, mainly nonsystematic, variations were found among all sectors of direct and indirect costs. Large variations were due primarily to inconsistent cost, resource and category definitions, methodology, and data sources—whether or not study results were derived nationally or based on population samples of disease incidence and prevalence. The latter studies usually showed substantially larger annual cost estimates and greater variation than the former.
CONCLUSION: Cost of illness studies are now of uncertain a priori usefulness. Criteria need to be developed to construct such studies so that they can be useful policy and planning tools.